

## Stratos *Eco* 2405

High Tech for an Amazingly Affordable Price

Premium Knick technology now in high-performance basic versions: The new Stratos *Eco* series is designed for use in almost all standard applications. The reliable 4-wire devices for measuring pH value, conductivity, or dissolved oxygen are the result of our highly efficient product development process.

### Complete Solutions for a Wide Range of Applications

- Simple industrial applications
- Downstream applications
- Water treatment
- Aerating of natural waters
- Energy production
- Boiler water
- Cooling water
- Salt brines
- Seawater desalination
- Mineral water
- Ion exchanger regeneration
- Drinking water / well water
- Reverse osmosis
- Fish farming



# Stratos Eco 2405

## Facts and Features

- Simple installation: large terminal compartment, preassembled cabinet
- Wall, post/pipe or panel mounting
- Application in hazardous locations (FM Class Div 2)
- Large, high-contrast display
- Easy and intuitive operation
- Optical alarm signaling by bright red LED
- Temperature display either in °C or °F
- Easy calibration with process medium
- 2nd current output for temperature measurement
- 2 floating relay contacts
- Sensocheck continuous sensor monitoring
- Sensoface preventive maintenance indication
- Calimatic automatic buffer recognition
- VariPower® power supply for 24 to 230 V AC/DC
- Concentration display (conductivity)
- Reset to factory settings possible
- 3-year warranty

	<b>4-wire process devices in the Stratos Eco series</b>
<b>pH/ORP measurement</b>	Stratos <i>Eco</i> 2405 pH
<b>Conductivity measurement with 2- or 4-electrode sensors</b>	Stratos <i>Eco</i> 2405 Cond
<b>Inductive conductivity measurement</b>	Stratos <i>Eco</i> 2405 Condl
<b>Dissolved oxygen measurement</b>	Stratos <i>Eco</i> 2405 Oxy

**Reliable Flexibility**

**Uncompromisingly Good**

From the calibration timer to the GainCheck automatic device self-test and from the red alarm LED to SensoCheck sensor monitoring, the Stratos **Eco** models contain the well-designed functionality of our proven Stratos devices.

**Allows for Worldwide Use**

Just one version with an integrated VariPower broad-range power supply unit enables trouble-free operation with any conventional supply voltage (20 to 253 V AC/DC), even with large power grid fluctuations.

**Easy to Operate**

The self-explanatory user interface ensures comfortable, intuitive operation. Measured values and temperatures are simultaneously displayed on the large, high-contrast LC display; measured value characters in plain text. International icons provide operating messages and signal unusual operating states. Status displays provide information on the current operating mode.

**Sensoface Preventive Maintenance Indication**



The sensor measures reliably.



The measured values are still acceptable; the sensor must be checked and replaced if necessary.



Unreliable measured values; the sensor must be replaced.

**Saves Costs**

Circuit technology unrivaled by other manufacturers means fewer electronic components and lower energy consumption. These features result in a MTBF value of 110 years – alongside the unusually long warranty period of 3 years. Stratos **Eco** stands for outstanding availability and extraordinary reliability.

**Rugged and Safe**

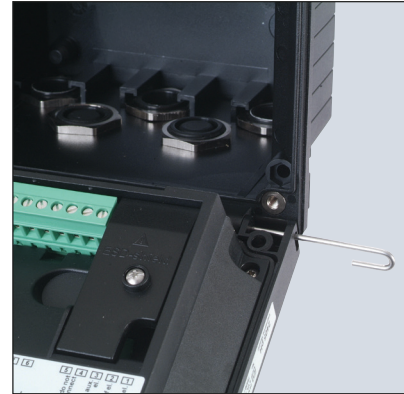
- Rugged PBT housing
- IP 65/NEMA 4 X protection
- Suitable for rigid metallic conduits
- Ex classification Class I Div 2



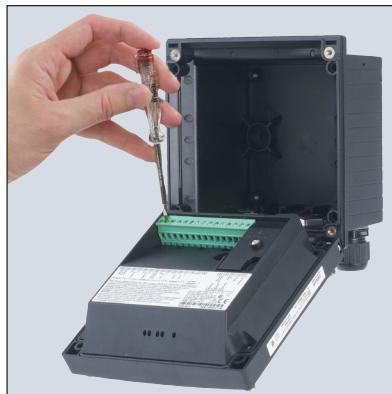
# Stratos Eco 2405

## Simple Installation

The ultra flat, fully encapsulated electronics are integrated into the front panel. This provides plenty of room inside the device for wiring and all parts are easily accessible.



Like the other Stratos series, the **Eco** series offers the option for wall, pipe/post, or panel mounting. Installation is simplified by plug-in terminals and an empty polymer housing made of rugged PBT that can be preassembled.



Cable glands:  
M20 x 1.5 and NPT 1/2" or  
rigid metallic conduit

Mounting Examples

**ZU 0274 Pipe-Mount Kit**

For mounting on vertical or horizontal posts or pipes.



**ZU 0276 Protective Hood**

Additional protection from direct weather exposure and mechanical damage.



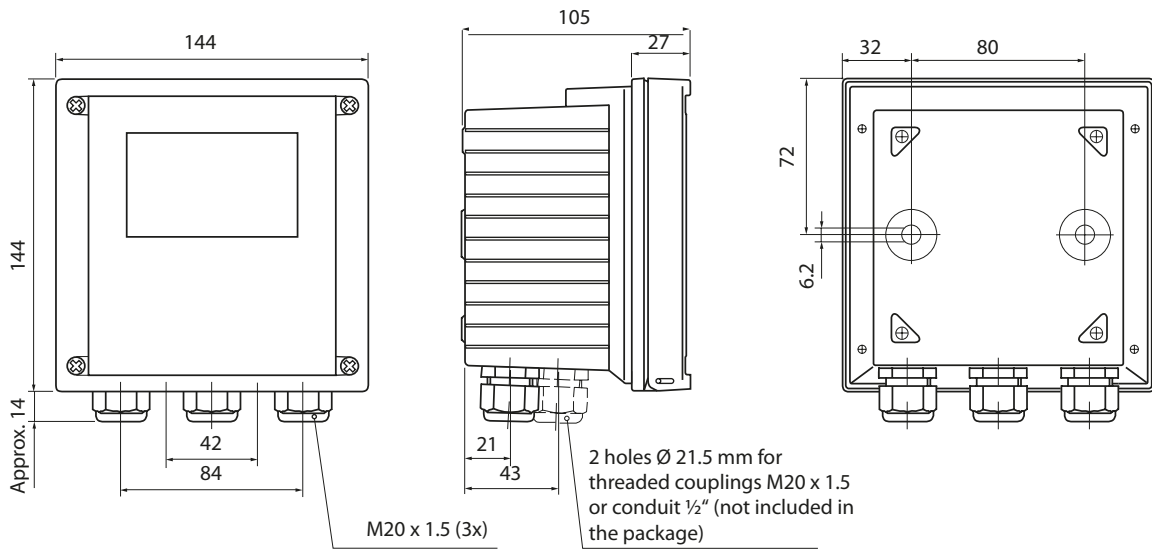
**ZU 0275 Panel-Mount Kit**

For mounting in standardized panel cutout 138 x 138 mm (DIN 43700), sealed against panel.



# Stratos Eco 2405

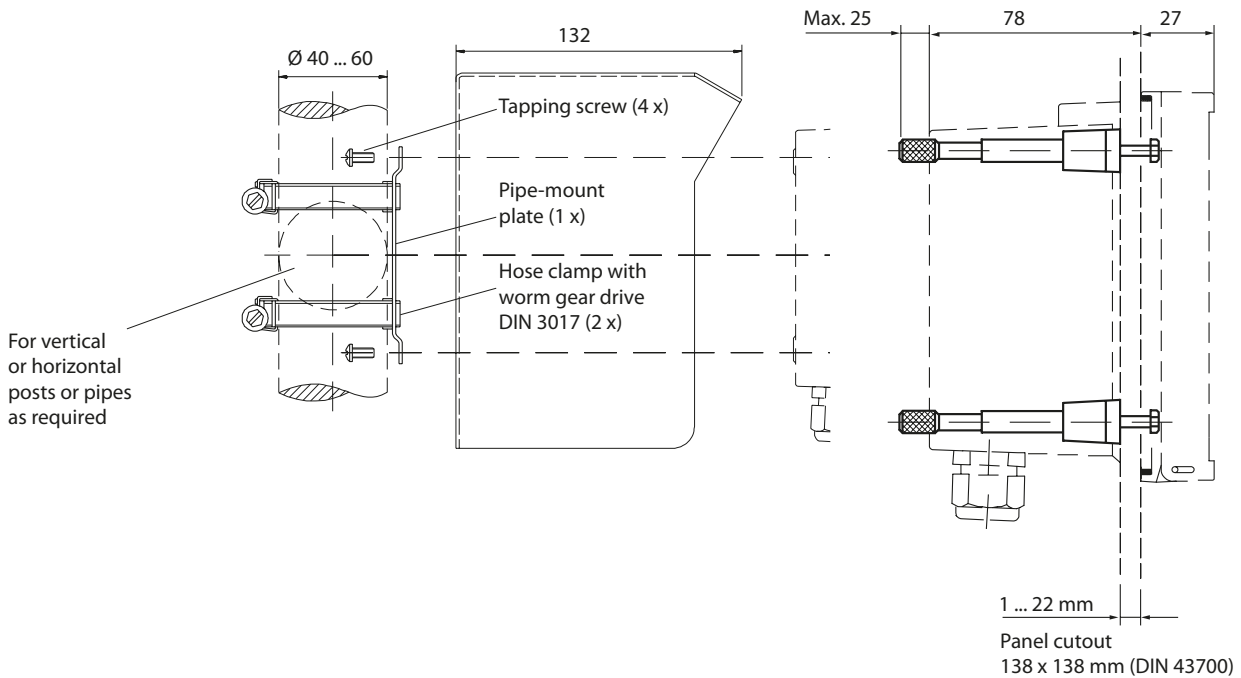
## Dimension Drawings



### ZU 0274 Pipe-Mount Kit

### ZU 0276 Protective Hood

### ZU 0275 Panel-Mount Kit



All dimensions in mm.

## Stratos *Eco* 2405 pH

### pH Measurement

Simultaneous display of pH/ORP and temperature; unit symbols as text.

Icons provide operating notes and signal unusual operating states; status displays provide information on the current operating mode.

### Connectible Sensors

- All customary pH sensors with nominal zero points of pH 7
- Combination electrodes or separate glass and reference electrodes
- Wide selection of temperature detectors (Pt100, Pt1000, NTC 30 k $\Omega$ , NTC 8.55 k $\Omega$  and Balco 3 k $\Omega$ )
- Typical metallic ORP electrodes (gold, platinum)



# Stratos Eco 2405 pH

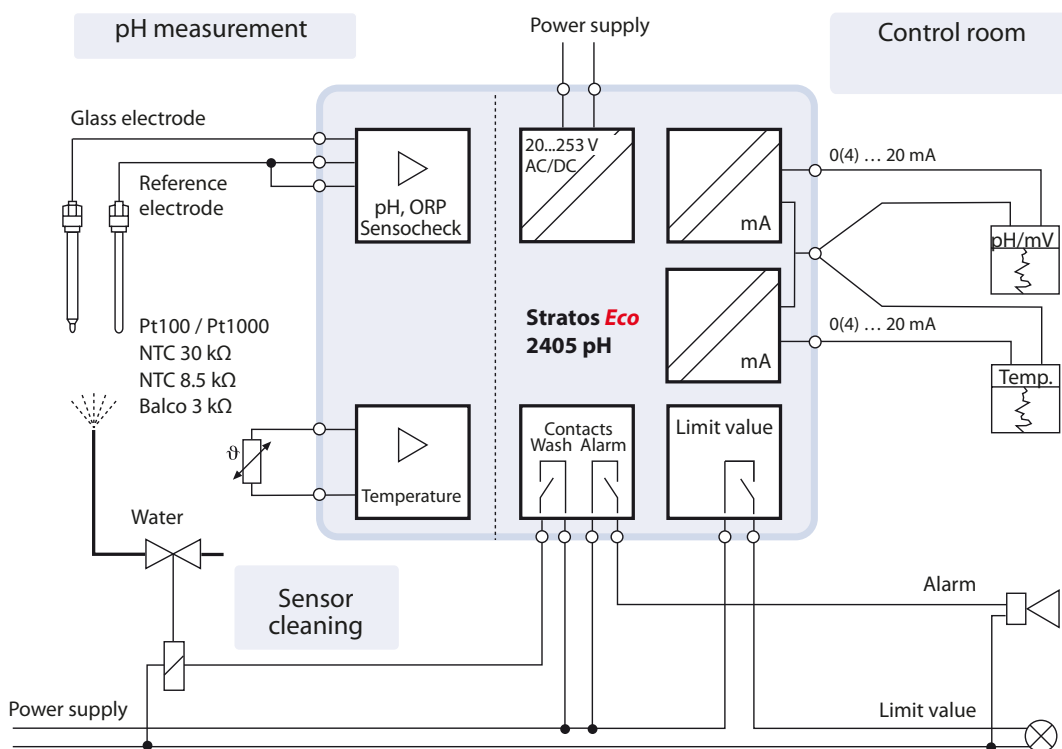
## Product Range

		Order No.
<b>Stratos Eco 2405 pH</b>	Process device for pH measurement	<b>2405 pH</b>

## Mounting Accessories

		Order No.
Pipe/post mount kit		<b>ZU 0274</b>
Panel mount kit		<b>ZU 0275</b>
Protective hood		<b>ZU 0276</b>

## Wiring





## Specifications

## pH/mV input

Input for pH or ORP sensors

Measuring range -1500 ... 1500 mV

Display range  
pH value: -2.00 ... 16.00  
ORP: -1999 ... 1999 mVGlass electrode input<sup>1)</sup>  
Input resistance > 0.5 x 10<sup>12</sup> Ω  
Input current < 2 x 10<sup>-12</sup> AReference electrode input<sup>1)</sup>  
Input resistance > 1 x 10<sup>10</sup> Ω  
Input current < 1 x 10<sup>-10</sup> AMeasurement error<sup>1,2,3)</sup>  
pH value: < 0.02  
TC: 0.002 pH/K (display)  
mV value: < 1 mV TC: 0.1 mV/K

## pH sensor standardization\*)

Operating modes

pH calibration

BUF Calibration with automatic  
buffer recognition Calimatic:

Buffer sets:

-00- Knick 2.00/4.01/7.00/9.21

-01- MettlerToledo 2.00/4.01/7.00/9.21

-02- Merck/Riedel de Haen 2.00/4.00/7.00/9.00/12.00

-03- Ciba (94) 2.06/4.00/7.00/10.00

-04- NIST technical 1.68/4.00/7.00/10.01/12.46

-05- NIST standard 1.679/4.006/6.865/9.180

-06- HACH 4.00/7.00/10.18

-07- WTW Technical Buffers 2.00/4.01/7.00/10.00

MAN Manual calibration with input of individual  
buffer values

DAT Data input of premeasured electrodes

Max. calibration range  
Asymmetry potential: ±60 mV  
Slope: 80 ... 103% (47.5 ... 61 mV/pH)

## ORP sensor standardization\*)

ORP calibration

Max. calibration range Δ: -700 ... 700 mV

Calibration timer 0000 ... 9999 h

Sensocheck Automatic glass electrode monitoring  
(can be disabled)Sensoface Provides information on sensor condition,  
zero point/slope evaluation, response time,  
calibration interval, SensocheckTemperature input\*)  
Pt100 / Pt1000 / NTC 30 kΩ  
NTC 8.55 kΩ / Balco 3 kΩ  
2-wire connection, adjustable

## Measuring range

Pt100 / Pt1000 -20.0 ... 200.0 °C / -4 ... 392 °F

NTC 30 kΩ -20.0 ... 150.0 °C / -4 ... 302 °F

NTC 8.55 kΩ -10.0 ... 130.0 °C / 14 ... 266 °F

Adjustment range 10 K

Resolution 0.1 °C/1 °F

Measurement error<sup>1,2,3)</sup>  
< 0.5 K (< 1 K for Pt100  
< 1 K for NTC > 100 °C)Temperature compensation  
of process medium Linear -19.99 ... 19.99%/K  
(reference temp. 25 °C)

# Stratos Eco 2405 pH

## Specifications

<b>Output 1</b>	0/4 ... 20 mA, max. 10 V, floating (galvanically connected to output 2)	
	Process variable*)	pH or mV value
	Overrange*)	22 mA in the case of error messages
	Output filter*)	Low-pass, filter time interval: 0 ... 120 s
	Measurement error	< 0.3% current value + 0.05 mA
	Start/end of scale*)	Configurable within the measuring range for pH or mV
	Permissible span	pH 2.00 ... 18.00/200 ... 3,000 mV
<b>Output 2</b>	0/4 ... 20 mA, max. 10 V, floating (galvanically connected to output 1)	
	Process variable	Temperature
	Overrange*)	22 mA for temperature error reports
	Output filter*)	Low-pass, filter time interval: 0 ... 120 s
	Measurement error <sup>1)</sup>	< 0.3% current value + 0.05 mA
	Start/end of scale*)	20 ... 200 °C / -4 ... 392 °F
	Permissible span	20 ... +200 K / 36 ... 396 °F
<b>Alarm contact</b>	"Alarm" contact, floating	AC < 250 V / < 3 A / < 750 VA DC < 30 V / < 3 A / < 90 W
	Contact response	N/C (fail-safe type)
	Alarm delay	10 s
	<b>Limit contact</b>	"R1" relay contact, floating
Contact response*)		N/C or N/O
Delay*)		0000 ... 9999 s
Setpoints*)		Within range
Hysteresis*)		0.00 ... 5.00 pH/0 ... 500 mV
<b>Cleaning contact</b>		"Clean" relay contact
	Contact response*)	N/C or N/O
	Rinsing interval*)	000.0 ... 999.9 h (000.0 h = cleaning function disabled)
	Rinse duration*)	0000 ... 1,999 s
	<b>Display</b>	LC display, 7-segment with icons
Primary display		Character height 17 mm, unit symbols 10 mm
Secondary display		Character height 10 mm, unit symbols 7 mm
Sensoface		3 status icons (friendly, neutral, sad)
Status display		4 status bars "meas","cal","Alarm","config" More icons for configuration and reports
Alarm indication		Red LED in case of alarm
<b>Keypad</b>		5 keys: [cal] [conf] [▶] [▲] [enter]

## Specifications

<b>Service functions</b>	Current source	Current specifiable for output 1 and 2 (00.00 ... 22.00 mA)
	Device self-test	Automatic memory test (RAM, FLASH, EEPROM)
	Display test	Display of all segments
	Last error	Display of last error occurred
	Sensor monitor	Display of direct, uncorrected sensor signal
	Data retention	Parameters and calibration data > 10 years (EEPROM)
	<b>Protection against electric shock</b>	Protective separation of all extra-low-voltage circuits against mains by double insulation as per EN 61010-1
<b>Power supply</b>	24 (-15%) ... 230 (+10%) V AC/DC	Approx. 5 VA/2.5 W AC: 45 ... 65 Hz Overvoltage category II, protection class II
<b>Nominal operating conditions</b>	Ambient temperature	-20 ... 55 °C / -4 ... 131 °F
	Relative humidity	10 ... 95%, non-condensing
	Maximum operating height	2,000 m
<b>Transport/Storage temperature</b>	-20 ... 70 °C / -4 ... 158 °F	
<b>EMC</b>	EN 61326-1, EN 61326-2-3	
	Emitted interference	Class B (residential environment) Class A: for mains > 60 V DC
	Immunity to interference	Industrial applications
<b>Explosion protection</b>	FM	NI, Class I Div 2, Groups A, B, C & D T4, T <sub>a</sub> = 55 °C; Type 2 NI, Class I Zone 2, Group IIC T4, T <sub>a</sub> = 55 °C; Type 2
<b>Housing</b>	Molded enclosure made of PBT (polybutylene terephthalate), glass bead reinforced	
	Color	Black
	Mounting	- Wall mounting - Post/pipe mounting ZU 0274 Ø 40 ... 60 mm □ 30 ... 45 mm - Panel installation ZU 0275 Cutout as per DIN 43 700, sealed against panel
	Dimensions (mm)	H x W x D 144 x 144 x 105
	Protection	IP 65/NEMA 4X
	Cable glands	3 knockouts for M20 x 1.5 cable glands 2 knockouts for NPT ½; or rigid metallic conduit
	Weight	Approx. 1 kg

<sup>\*)</sup> User-defined

<sup>1)</sup> At nominal operating conditions

<sup>2)</sup> ±1 digit

<sup>3)</sup> Plus sensor error

# Stratos Eco 2405 pH

## Terminal Assignments


20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
24 to 230 V ac/dc		clean	alarm	do not connect		rel. 1	+ - +		out 2	out 1					RTD do not connect	RTD	aux. el.	ref. el.	meas. el.
power										do not connect									
contacts										output									


**MAX. RELAY CONTACT RATING:** AC < 250 V / < 3 A / < 750 VA, DC < 30 V / < 3 A / < 90 W, RESISTIVE  
**WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.**  
**WARNING - BONDING BETWEEN CONDUIT IS NOT AUTOMATIC AND MUST BE PROVIDED AS PART OF THE INSTALLATION. SEE INSTALLATION INSTRUCTIONS.**  
**WARNING - SUBSTITUTION OF COMPONENTS MAY IMPAIR SAFETY.**  
**WARNING - CLEAN ONLY WITH ANTISTATIC MOISTENED CLOTH.**  
**CAUTION - USE SUPPLY WIRES SUITABLE FOR 30°C ABOVE SURROUNDING AMBIENT AND RATED AT LEAST 250 V. USE SIGNAL WIRES SUITABLE FOR AT LEAST 250 V.**  
**AVERTISSEMENT - RISQUE D'EXPLOSION - AVANT DE DECONNECTER L'EQUIPEMENT, COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DESIGNÉ NON DANGEREUX.**

NI, CLI, DIV2, GPA, B, C, D, T4  
 NI, CLI, ZN2, GPIIC, T4  
 CLI DIV2 GPA, B, C, D, T4  
 Ex nA IIC T4

ENCLASURE TYPE 2  
 Tamb -20 to +55 °C

Made in Germany




 75430/000000 F-2405PH

## Stratos *Eco* 2405 Cond

### Conductivity Measurement

Simultaneous display of conductivity/  
resistance/salinity and temperature;  
large unit symbols.

Icons provide operating notes and  
signal unusual operating states; status  
displays provide information on the  
current operating mode.



### Connectible Sensors

- All known types of 2-electrode sensors
- All known types of 4-electrode sensors
- Freely selectable cell constants 0.005 to 20 cm<sup>-1</sup>
- Selectable temperature detectors Pt100, Pt1000, NTC 30 kΩ, NTC 8.55 kΩ

# Stratos Eco 2405 Cond

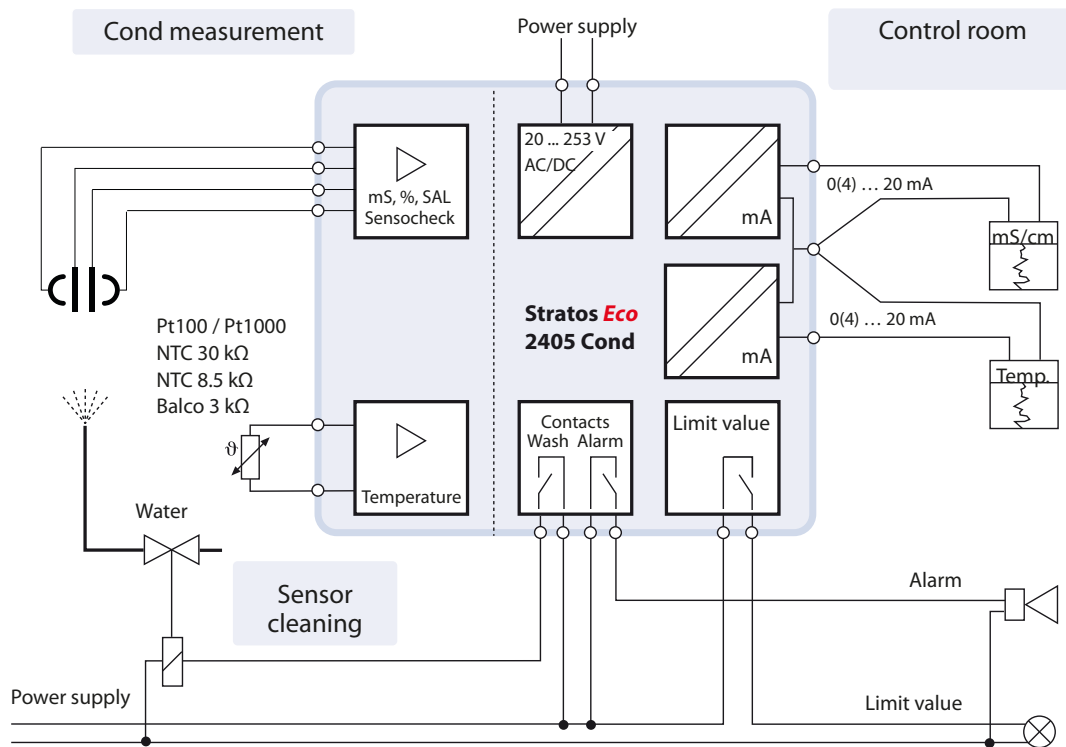
## Product Range

		Order No.
<b>Stratos Eco 2405 Cond</b>	Process device for measuring conductivity with 2- and 4-electrode sensors	<b>2405 Cond</b>

## Mounting Accessories

	Order No.
Pipe/post mount kit	<b>ZU 0274</b>
Panel mount kit	<b>ZU 0275</b>
Protective hood	<b>ZU 0276</b>

## Wiring



## Specifications

**Conductivity input**

Measuring ranges\*)

Input for 2- or 4-electrode sensors

Measuring range 0.2  $\mu\text{S} \cdot \text{cm} \dots 1000 \text{ mS} \cdot \text{cm}$ 

Conductivity

0.000 ... 9.999  $\mu\text{S}/\text{cm}$   
 0.00 ... 99.99  $\mu\text{S}/\text{cm}$   
 0.0 ... 999.9  $\mu\text{S}/\text{cm}$   
 0 ... 9999  $\mu\text{S}/\text{cm}$   
 0.000 ... 9.999  $\text{mS}/\text{cm}$   
 0.00 ... 99.99  $\text{mS}/\text{cm}$   
 0.0 ... 999.9  $\text{mS}/\text{cm}$   
 0.000 ... 9.999  $\text{S}/\text{m}$   
 0.00 ... 99.99  $\text{S}/\text{m}$

Resistivity 0.00 ... 99.99  $\text{m}\Omega \cdot \text{cm}$ 

Concentration 0.00 ... 9.99%

Salinity 0.0 ... 45.0‰ (0 ... 35 °C)

Response time (T90) &lt; 1 s (Sensocheck off)

&lt; 3 s (Sensocheck on)

Measurement error<sup>1,2,3</sup> < 1% meas. val. + 0.4  $\mu\text{S} \cdot \text{cm}$ **Concentration determination**

[1] NaCl 0.00 ... 9.99 wt% (0 ... 100 °C)

[2] HCl 0.00 ... 9.99 wt% (-20 ... 50 °C)

[3] NaOH 0.00 ... 9.99 wt% (0 ... 100 °C)

[4] H<sub>2</sub>SO<sub>4</sub> 0.00 ... 9.99 wt% (-17 ... 110 °C)[5] HNO<sub>3</sub> 0.00 ... 9.99 wt% (-17 ... 50 °C)**Sensor standardization**

– Input of cell constant with simultaneous display of conductivity and temperature

– Input of conductivity of calibration solution with simultaneous display of cell constant and temperature

– Product calibration

– Temperature detector adjustment

Permissible cell constant 0.0050...19.9999  $\text{cm}^{-1}$ **Sensocheck**

Polarization detection and monitoring of cable capacitance

**Sensoface**

Provides information on the sensor condition (Sensocheck)

**Sensor monitor**

Direct display of measured values from sensor for validation (resistance/temperature)

**Temperature input\*)**Pt 100 / Pt 1000 / NTC 30 k $\Omega$  / NTC 8.55 k $\Omega$  (Betatherm), 2-wire connection, adjustable

Measuring range

Pt 100 / Pt 1000 -20.0 ... 200.0 °C / -4 ... 392 °F

NTC 30 k $\Omega$  -20.0 ... 150.0 °C / -4 ... 302 °FNTC 8.55 k $\Omega$  -10.0 ... 130.0 °C / 14 ... 266 °F

Resolution 0.1 °C/1 °F

Measurement error<sup>1,2,3</sup> < 0.5 K

(&lt; 1 K at Pt 100; &lt; 1 K at NTC &gt; 100°C)

Temperature compensation\*)

(OFF) without

(Reference temp 25°C)

(LIN) Linear characteristic 00.00...19.99%/K

(NLF) Natural waters acc. to EN 27888



(NaCl) Ultrapure water with NaCl traces (0...120 °C)

(HCl) Ultrapure water with HCl traces (0...120 °C)

(NH<sub>3</sub>) Ultrapure water with NH<sub>3</sub> traces (0...120 °C)

# Stratos Eco 2405 Cond

## Specifications

<b>Output 1</b>	0/4 ... 20 mA, max. 10 V, floating	(galvanically connected to output 2)	
	Process variable <sup>*)</sup>	Conductivity, spec. resistivity, concentration or salinity	
	Overrange <sup>*)</sup>	22 mA in the case of error messages	
	Output filter <sup>*)</sup>	Low-pass, filter time interval 0 ... 120 s	
	Measurement error <sup>1)</sup>	< 0.3% current value + 0.05 mA	
	Start/end of scale <sup>*)</sup>	As desired within range	
	Minimum span	5% of selected range	
<b>Output 2</b>	0/4 ... 20 mA, max. 10 V, floating (galvanically connected to output 1)		
	Process Variable	Temperature	
	Overrange <sup>*)</sup>	22 mA for temperature error reports	
	Output filter <sup>*)</sup>	Low-pass, filter time interval 0 ... 120 s	
	Measurement error <sup>1)</sup>	< 0.3 % current value + 0.05 mA	
	Start/end of scale <sup>*)</sup>	-20 ... 300 °C / -4 ... 72 °F	
	Permissible span	20 ... 320 K / 36 ... 576 °F	
<b>Alarm contact</b>	Relay contact, floating	AC < 250 V / < 3 A / < 750 VA DC < 30 V / < 3 A / < 90 W	
	Contact response	N/C (fail-safe type)	
	Alarm delay <sup>*)</sup>	10 s	
	<b>Limit contact</b>	"R1" relay contact, floating	AC < 250 V / < 3 A / < 750 VA DC < 30 V / < 3 A / < 90 W
		Contact response <sup>*)</sup>	N/O or N/C
Delay <sup>*)</sup>		0000 ... 9999 s	
<b>Cleaning contact</b>	Setpoints <sup>*)</sup>	As desired within range	
	Hysteresis <sup>*)</sup>	0...50% of range	
	"Clean" contact	AC < 250 V / < 3 A / < 750 VA DC < 30 V / < 3 A / < 90 W	
	Contact response <sup>*)</sup>	N/C or N/O	
	Rinsing interval <sup>*)</sup>	000.0 ... 999.9 h (000.0 h = cleaning function disabled)	
<b>Display</b>	Rinse duration <sup>*)</sup>	0000 ... 1,999 s	
	LC display, 7-segment with icons		
	Primary display	Character height 17 mm, unit symbols 10 mm	
	Secondary display	Character height 10 mm, unit symbols 7 mm	
	Sensoface	3 status icons (friendly, neutral, sad face)	
<b>Keypad</b>	Status display	4 status bars "meas," "cal," "Alarm," "config" More icons for configuration and reports	
	Alarm indication	Red LED in case of alarm	
	5 keys: [cal] [conf]   [enter]		



## Specifications

<b>Service functions</b>	Current source	Current specifiable for output 1 and 2 (00.00 ... 22.00 mA)	
	Device self-test	Automatic memory test (RAM, FLASH, EEPROM)	
	Display test	Display of all segments	
	Last error	Display of last error occurred	
	Sensor monitor	Display of direct, uncorrected sensor signal (sensor)	
<b>Data retention</b>	Parameters and calibration data > 10 years (EEPROM)		
<b>Protection against electric shock</b>	Protective separation of all extra-low-voltage circuits against mains by double insulation as per EN 61010-1		
<b>Power supply</b>	24 V (-15%) ... 230 (+10%) V AC/DC	Approx. 5 VA/2.5 W AC: 45 ... 65 Hz Overvoltage category II, protection class II	
	<b>Nominal operating conditions</b>	Ambient temperature	-20 ... 55 °C / -4 ... 131 °F
	Relative humidity	10 ... 95%, non-condensing	
<b>Transport/Storage temperature</b>	Maximum operating height	2,000 m	
		-20 ... 70 °C / -4 ... 158 °F	
<b>EMC</b>	EN 61326-1, EN 61326-2-3		
	Emitted interference	Class B (residential environment) Class A: for mains > 60 V DC	
	Immunity to interference	Industrial applications	
<b>Explosion protection</b>	FM	NI, Class I Div 2, Groups A, B, C & D T4, T <sub>a</sub> = 55 °C; Type 2	
		NI, Class I Zone 2, Group IIC T4, T <sub>a</sub> = 55 °C; Type 2	
<b>Housing</b>	Molded enclosure made of PBT (polybutylene terephthalate), glass bead reinforced		
	Color	Black	
	Mounting	– Wall mounting	
		– Post/pipe mounting ZU 0274 Ø 40 ... 60 mm □ 30 ... 45 mm	
		– Panel installation ZU 0275 Cutout as per DIN 43 700, sealed against panel	
	Dimensions (mm)	H x W x D 144 x 144 x 105	
	Protection	IP 65/NEMA 4X	
	Cable glands	3 knockouts for M20 x 1.5 cable glands	
		2 knockouts for NPT ½" or rigid metallic conduit	
	Weight	Approx. 1 kg	

\*) User-defined

1) At nominal operating conditions

2) ±1 digit

3) Plus sensor error

# Stratos Eco 2405 Cond

## Terminal Assignments

20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	
24 to 230 V ac/dc												SG					Made in Germany			
clean		alarm		do not connect		rel. 1		out 2		out 1				RTD	RTD	shield				
power												contacts		output		do not connect		E	D	C

**MAX. RELAY CONTACT RATING:** AC < 250 V / < 3 A / < 750 VA, DC < 30 V / < 3 A / < 90 W, RESISTIVE  
**WARNING - EXPLOSION HAZARD- DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.**  
**WARNING - BONDING BETWEEN CONDUIT IS NOT AUTOMATIC AND MUST BE PROVIDED AS PART OF THE INSTALLATION. SEE INSTALLATION INSTRUCTIONS.**  
**WARNING - SUBSTITUTION OF COMPONENTS MAY IMPAIR SAFETY.**  
**WARNING - CLEAN ONLY WITH ANTISTATIC MOISTENED CLOTH.**  
**CAUTION - USE SUPPLY WIRES SUITABLE FOR 30°C ABOVE SURROUNDING AMBIENT AND RATED AT LEAST 250 V. USE SIGNAL WIRES SUITABLE FOR AT LEAST 250 V.**  
**AVERTISSEMENT - RISQUE D'EXPLOSION - AVANT DE DECONNECTER L'EQUIPEMENT, COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DESIGNÉ NON DANGEREUX.**

NI, CLI, DIV2, GPA, B, C, D, T4  
 NI, CLI, ZN2, GPIIC, T4  
 CLI DIV2 GPA, B, C, D, T4  
 Ex nA IIC T4

ENCLASURE TYPE 2  
 Tamb -20 to +55 °C

75431/000000      F-2405COND

## Stratos *Eco* 2405 Condi

### inductive Conductivity Measurement

Simultaneous display of conductivity/  
resistance/salinity and temperature;  
large unit symbols.

Icons provide operating notes and sig-  
nal unusual operating states; status  
displays provide information on the  
current operating mode.

#### Connectible sensors

- Many conventional European and American toroidal sensors
- Temperature detector  
Pt100, Pt1000,  
NTC 100 kΩ

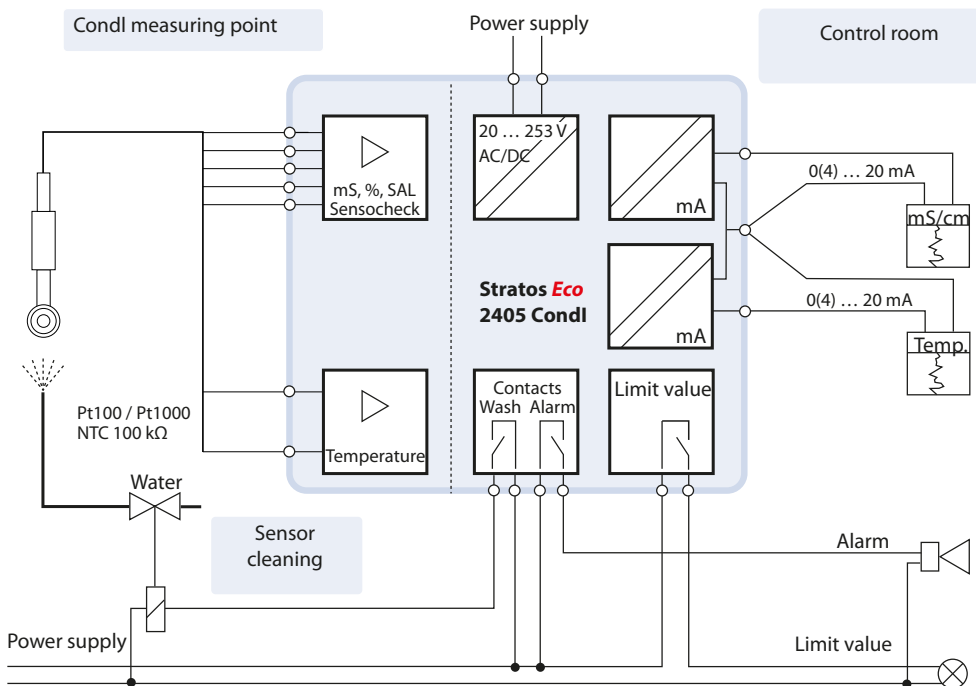


# Stratos Eco 2405 Condl

## Product Range

		Order No.
<b>Stratos Eco 2405 Condl</b>	Process device for measuring conductivity with toroidal sensors	2405 Condl
<b>Mounting Accessories</b>		
Pipe/post mount kit		ZU 0274
Panel mount kit		ZU 0275
Protective hood		ZU 0276

## Wiring



## Specifications

<b>Cond input</b>	Input for toroidal conductivity sensors	SE 655, SE 656, SE 660, etc.	
Display ranges	Conductivity	0.000 ... 1,999 mS/cm	
	Concentration	0.00 ... 9.99% by wt	
	Salinity	0.0 ... 45‰ (0 ... 35 °C)	
Measuring ranges	Conductivity	0.000 ... 9.999 mS/cm 0.00 ... 99.99 mS/cm 0.0 ... 999.9 mS/cm 0 ... 1,999 mS/cm 0.000 ... 9.999 S/m 0.00 ... 99.99 S/m	
	Concentration	0.00 ... 9.99% 10.0 ... 100.0%	
	Salinity	0.0 ... 45.0‰ (0 ... 35 °C)	
	Response time (T <sub>90</sub> )	approx. 2 s	
	Measurement error <sup>1,2,3)</sup>	1% meas. val. + 0.005 mS	
	<b>Temperature compensation</b> <sup>*)</sup> (Reference temp 25 °C)	(OFF)	Without
		(LIN)	Linear characteristic 00.00...19.99%/K
		(NLF)	natural waters as per EN 27888 (0 ... 35 °C)
	<b>Concentration determination</b>	[1] NaCl	0.00 ... 9.99 wt% (0 ... 100 °C)
		[2] HCl	0.00 ... 9.99 wt% (-20 ... 50 °C)
		[3] NaOH	0.00 ... 9.99 wt% (0 ... 100 °C)
[4] H <sub>2</sub> SO <sub>4</sub>		0.00 ... 9.99 wt% (-17 ... 110 °C)	
[5] HNO <sub>3</sub>		0.00 ... 9.99 wt% (-20 ... 50 °C)	
<b>Sensor standardization</b>	– Input of cell factor with simultaneous display of conductivity and temperature		
	– Input of conductivity of calibration solution with simultaneous display of cell factor and temperature		
	– Product calibration		
	– Zero adjustment		
	– Temperature detector adjustment		
	Permissible cell factor	0.100 ... 19.999	
	Permissible transfer ratio	1.00 ... 199.99	
Permissible offset	±0.5 mS/cm		
<b>Sensocheck</b>	– Monitoring of primary and wiring for short circuit		
	– Monitoring of secondary and wiring for open circuit		
<b>Sensoface</b>	Provides information on the sensor condition (evaluation of zero point, Sensocheck)		
<b>Sensor monitor</b>	Sensor monitor for validation of sensor and complete measured-value processing (display: resistance/temperature)		
<b>Temperature input</b> <sup>*)</sup> Measuring ranges	Pt 100 / Pt 1000 / NTC 100 kΩ, 2-wire connection, adjustable		
	Pt 100/Pt 1000	-20.0 ... 200.0 °C / -4 ... 392 °F	
	NTC 100 kΩ	-20.0 ... 130.0 °C / -4 ... 266 °F	
	Resolution	0.1 °C/1 °F	
	Measurement error <sup>1,2,3)</sup>	< 0.5 K (< 1 K for Pt 100; < 1 K for NTC > 100 °C)	

# Stratos Eco 2405 Condi

## Specifications

<b>Output 1</b>	0/4 ... 20 mA, max. 10 V, floating	
Process variable*)	Conductivity, concentration, or salinity	(galvanically connected to output 2)
	Overrange*)	22 mA in the case of error messages
	Output filter*) (attenuation)	Low-pass, filter time interval 0 ... 120 s
	Measurement error <sup>1)</sup>	< 0.3% current value + 0.05 mA
	Start/end of scale	As desired within range
	Minimum span	5% of selected range
<b>Output 2</b>	0/4 ... 20 mA, max. 10 V, floating (galvanically connected to output 1)	
Process variable	Temperature	
	Overrange*)	22 mA in the case of error messages
	Output filter*) (attenuation)	Low-pass, filter time interval 0 ... 120 s
	Measurement error <sup>1)</sup>	< 0.3% current value + 0.05 mA
	Start/end of scale*)	-20 ... 300 °C / -4 ... 572 °F
	Permissible span	20 ... 320 K / 36 ... 576 °F
<b>Alarm contact</b>	Contact, floating	AC < 250 V / < 3 A / < 750 VA DC < 30 V / < 3 A / < 90 W
	Contact response	N/C (fail-safe type)
	Alarm delay	10 s
<b>Limit contact</b>	"R1" relay contact, floating	AC < 250 V / < 3 A / < 750 VA DC < 30 V / < 3 A / < 90 W
	Contact response*)	N/C or N/O
	Delay*)	0000 ... 9999 s
	Setpoints*)	As desired within range
	Hysteresis*)	0...50% of range
<b>Cleaning contact</b>	"Clean" relay contact	AC < 250 V / < 3 A / < 750 VA DC < 30 V / < 3 A / < 90 W
	Contact response*)	N/C or N/O
	Rinsing interval*)	000.0 ... 999.9 h (000.0 h = cleaning function disabled)
	Rinse duration*)	0000 ... 1,999 s
<b>Display</b>	LC display, 7-segment with icons	
	Primary display	Character height 17 mm, unit symbols 10 mm
	Secondary display	Character height 10 mm, unit symbols 7 mm
	Sensoface	3 status icons (friendly, neutral, sad)
	Status display	4 status bars "meas," "cal," "Alarm," "config" More icons for configuration and reports
	Alarm indication	Red LED in case of alarm
<b>Keypad</b>	5 keys: [cal] [conf] [▶] [▲] [enter]	

## Specifications

<b>Service functions</b>	Current source	Current specifiable for output 1 and 2 (00.00 ... 22.00 mA)	
	Device self-test	Automatic memory test (RAM, FLASH, EEPROM)	
	Display test	Display of all segments	
	Last error	Display of last error occurred	
	Sensor monitor	Display of direct, uncorrected sensor signal (sensor)	
<b>Data retention</b>	Parameters and calibration data > 10 years (EEPROM)		
<b>Protection against electric shock</b>	Protective separation of all extra-low-voltage circuits against mains by double insulation as per EN 61010-1		
<b>Power supply</b>	24 V (-15%) ... 230 (+10%) V AC/DC	Approx. 5 VA/2.5 W AC: 45 ... 65 Hz Overvoltage category II, protection class II	
	<b>Nominal operating conditions</b>	Ambient temperature	-20 ... 55 °C / -4 ... 131 °F
	Relative humidity	10 ... 95%, non-condensing	
<b>Transport/Storage temperature</b>	Maximum operating height	2,000 m	
		-20 ... 70 °C / -4 ... 158 °F	
<b>EMC</b>	EN 61326-1, EN 61326-2-3		
	Emitted interference	Class B (residential environment) Class A: for mains > 60 V DC	
	Immunity to interference	Industrial applications	
<b>Explosion protection</b>	FM	NI, Class I Div 2, Groups A, B, C & D T4, T <sub>a</sub> = 55 °C; Type 2 NI, Class I Zone 2, Group IIC T4, T <sub>a</sub> = 55 °C; Type 2	
	<b>Housing</b>	Molded enclosure made of PBT (polybutylene terephthalate), glass bead reinforced	
	Color	Black	
	Mounting	- Wall mounting	
		- Post/pipe mounting ZU 0274 Ø 40 ... 60 mm □ 30 ... 45 mm	
		- Panel installation ZU 0275 Cutout as per DIN 43 700 Sealed against panel	
		Dimensions (mm)	H x W x D 144 x 144 x 105
	Protection	IP 65/NEMA 4X	
	Cable glands	3 knockouts for M20 x 1.5 cable glands	
		2 knockouts for NPT ½" or rigid metallic conduit	
	Weight	Approx. 1 kg	

\*) User-defined

1) At nominal operating conditions

2) ±1 digit

3) Plus sensor error

# Stratos Eco 2405 Condi

## Terminal Assignments

20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1				
24 to 230 V ac/dc		clean	alarm	do not connect	rel. 1	+	-	+	out 2	out 1	+	hi	lo	send	lo	hi	RTD	RTD	shield drain	receive			
power											contacts		output		do not connect		E		D		C		Made in Germany
<p>MAX. RELAY CONTACT RATING: AC &lt; 250 V / &lt; 3 A / &lt; 750 VA, DC &lt; 30 V / &lt; 3 A / &lt; 90 W, RESISTIVE</p> <p>WARNING -EXPLOSION HAZARD- DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.</p> <p>WARNING -BONDING BETWEEN CONDUIT IS NOT AUTOMATIC AND MUST BE PROVIDED AS PART OF THE INSTALLATION. SEE INSTALLATION INSTRUCTIONS.</p> <p>WARNING -SUBSTITUTION OF COMPONENTS MAY IMPAIR SAFETY.</p> <p>WARNING -CLEAN ONLY WITH ANTISTATIC MOISTENED CLOTH.</p> <p>CAUTION -USE SUPPLY WIRES SUITABLE FOR 30°C ABOVE SURROUNDING AMBIENT AND RATED AT LEAST 250 V. USE SIGNAL WIRES SUITABLE FOR AT LEAST 250 V.</p> <p>AVERTISSEMENT -RISQUE D'EXPLOSION-AVANT DE DECONNECTER L'EQUIPEMENT, COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DESIGNÉ NON DANGEREUX.</p> <p>NI, CLI, DIV2, GPA, B, C, D, T4</p> <p>NI, CLI, ZN2, GPIIC, T4</p> <p>CLI DIV2 GPA, B, C, D, T4</p> <p>Ex nA IIC T4</p> <p>ENCLOSURE TYPE 2</p> <p>Tamb -20 to +55 °C</p> <p></p> <p>75432/000000 F-2405CONDI</p>																							



## Stratos *Eco* 2405 Oxy

### Oxygen Measurement

Simultaneous temperature and measured value display; unit symbol as plain text.

Icons provide operating notes and signal unusual operating states; status displays provide information on the current operating mode.



### Connectible Sensors

- Conventional amperometric sensors with (e.g., -675 mV) or without polarization voltage
- Temperature detector  
NTC 22 k $\Omega$ , NTC 30 k $\Omega$

# Stratos Eco 2405 Oxy

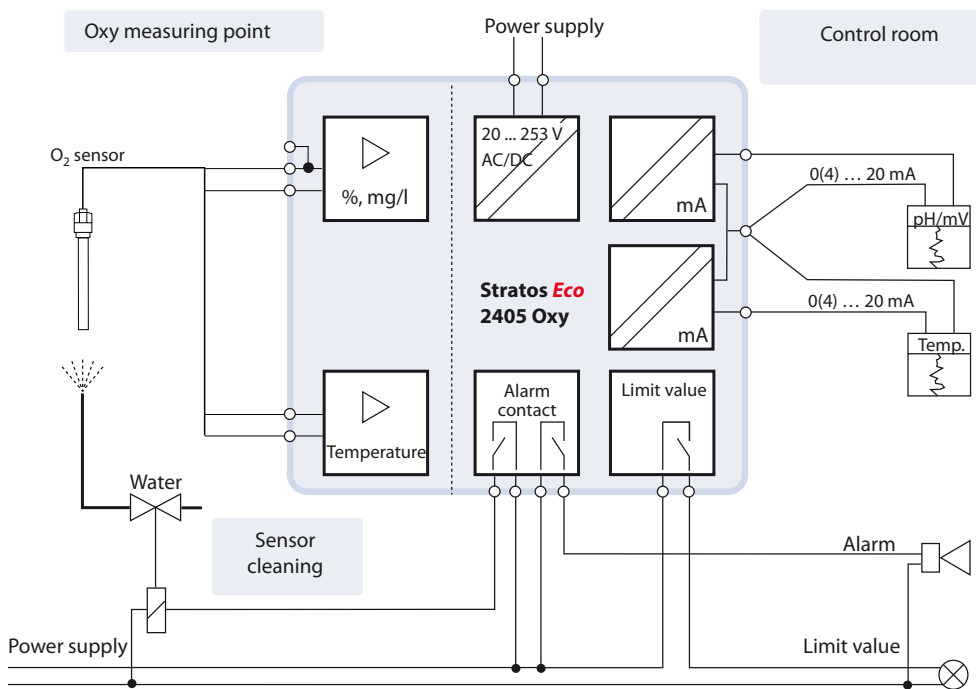
## Product Range

		Order No.
<b>Stratos Eco 2405 Oxy</b>	Process device for measuring dissolved oxygen	<b>2405 Oxy</b>

## Mounting Accessories

		Order No.
Pipe/post mount kit		<b>ZU 0274</b>
Panel mount kit		<b>ZU 0275</b>
Protective hood		<b>ZU 0276</b>

## Wiring



## Specifications

**O<sub>2</sub> input**

Measuring current	-2 ... 1800 nA
Resolution (at $U_{pol} \leq 800$ mV and $U_{ref} \leq 200$ mV)	0.05 nA
Saturation (-10 ... 80 °C)	0 ... 200%
Measurement error <sup>1,2,3)</sup>	0.5% meas.val. + 0.5%
Concentration (-10 ... 80 °C)	0.00 ... 20.00 mg/l 0.00 ... 20.00 ppm
Measurement error <sup>1,2,3)</sup>	0.5% meas.val. + 0.05 mg/l or 0.05 ppm
Permissible guard current	$\leq 20$ $\mu$ A
Polarization voltage*)	0 ... 1000 mV -1000 ... 0 mV
Process pressure*)	0.000 ... 9.999 bar (... 999.9 kPa / ... 145.0 PSI)
Salinity correction*)	00.00 ... 45.00 g/kg

**Sensor standardization**

Operating modes	O <sub>2</sub> concentration (automatic) O <sub>2</sub> saturation (automatic) Product calibration, zero point calibration
Calibration range	Zero point $\pm 2$ nA Slope 25 ... 130 nA (at 25 °C, 1013 mbar)
Calibration timer*)	0000 ... 9999 h
Pressure correction*)	0.000 ... 9.999 bar / 999.9 kPa / 145.0 PSI

**Sensocheck**

Monitoring for short circuits or open circuits (can be disabled)

**Sensoface**

Provides information on sensor condition (evaluation of zero point/slope, response time, calibration interval, Sensocheck)

**Temperature input\*)**

NTC 22 k $\Omega$ /NTC 30 k $\Omega$	2-wire connection, adjustable
Measuring range	-20.0 ... 150.0 °C / -4 ... 302 °F
Adjustment range	10 K
Resolution	0.1 °C/1 °F
Measurement error <sup>1,2,3)</sup>	< 0.5 K (< 1 K at > 100 °C)

# Stratos Eco 2405 Oxy

## Specifications

<b>Output 1</b>	0/4 ... 20 mA, max. 10 V, floating (galvanically connected to output 2)
	Process variable*) O <sub>2</sub> saturation / O <sub>2</sub> concentration
	Overrange*) 22 mA in the case of error messages
	Output filter*) Low-pass, filter time interval 0 ... 120 s
	Measurement error <sup>1)</sup> < 0.3% current value + 0.05 mA
	Start/end of scale As desired within range
	Permissible span 5 ... 200% / 0.5 ... 50 mg/l (ppm)
<b>Output 2</b>	0/4 ... 20 mA, max. 10 V, floating (galvanically connected to output 1)
	Process variable*) Temperature
	Overrange*) 22 mA for temperature error reports
	Output filter*) Low-pass, filter time interval 0 ... 120 s
	Measurement error <sup>1)</sup> < 0.3% current value + 0.05 mA
	Start/end of scale -20 ... 150 °C / -4 ... 302 °F
	Permissible span 20 ... 170 K / 36 ... 306 °F
<b>Alarm contact</b>	Relay contact, floating
	Contact ratings AC < 250 V / < 3 A / < 750 VA DC < 30 V / < 3 A / < 90 W
	Contact response N/C (fail-safe type)
	Response delay 10 s
<b>Limit contact</b>	"R1" relay contact, floating
	Contact ratings AC < 250 V / < 3 A / < 750 VA DC < 30 V / < 3 A / < 90 W
	Contact response*) N/C or N/O
	Delay*) 0000 ... 9999 s
	Setpoints*) Within selected range
	Hysteresis*) 0.00 ... 5.00 pH/0 ... 500 mV
<b>Cleaning contact</b>	"Clean" contact AC < 250 V / < 3 A / < 750 VA DC < 30 V / < 3 A / < 90 W
	Contact response*) N/C or N/O
	Rinsing interval*) (000.0 h = cleaning function disabled)
	Rinse duration*) 0000 ... 1,999 s
<b>Display</b>	LC display, 7-segment with icons
	Primary display Character height 17 mm, unit symbols 10 mm
	Secondary display Character height 10 mm, unit symbols 7 mm
	Sensoface 3 status icons (friendly, neutral, sad)
	Status display 4 status bars "meas," "cal," "Alarm," "config" More icons for configuration and reports
	Alarm indication Red LED in case of alarm
<b>Keypad</b>	5 keys: [cal] [conf] ► [▲] [enter]

## Specifications

<b>Service functions</b>	Current source	Current specifiable for output 1 and 2 (00.00 ... 22.00 mA)
	Device self-test	Automatic memory test (RAM, FLASH, EEPROM)
	Display test	Display of all segments
	Last error	Display of last error occurred
	Sensor monitor	Display of direct, uncorrected sensor signal (sensor)
<b>Data retention</b>	Parameters and calibration data > 10 years (EEPROM)	
<b>Protection against electric shock</b>	Protective separation of all extra-low-voltage circuits against mains by double insulation as per EN 61010-1	
<b>Power supply</b>	24 (-15%) ... 230 (+10%) V AC/DC	approx. 5 VA/2.5 W AC: 45 ... 65 Hz Overvoltage category II, protection class II
<b>Nominal operating conditions</b>	Ambient temperature	-20 ... 55 °C / -4 ... 131 °F
	Relative humidity	10 ... 95%, non-condensing
	Maximum operating height	2,000 m
<b>Transport/Storage temperature</b>	-20 ... 70 °C / -4 ... 158 °F	
<b>EMC</b>	EN 61326-1, EN 61326-2-3	
	Emitted interference	Class B (residential environment) Class A: for mains > 60 V DC
	Immunity to interference	Industrial applications
<b>Explosion protection</b>	FM	NI, Class I Div 2, Groups A, B, C & D T4, T <sub>a</sub> = 55 °C; Type 2 NI, Class I Zone 2, Group IIC T4, T <sub>a</sub> = 55 °C; Type 2
	CSA	Class I Div 2, Groups A, B, C and D, T4 Ex nA IIC T4
<b>Housing</b>	Molded enclosure made of PBT (polybutylene terephthalate), glass bead reinforced	
	Color	Black
	Mounting	- Wall mounting - Post/pipe mounting ZU 0274 Ø 40 ... 60 mm □ 30 ... 45 mm - Panel installation ZU 0275 Cutout as per DIN 43 700, sealed against panel
	Dimensions (mm)	H x W x D 144 x 144 x 105
	Protection	IP 65/NEMA 4X
	Cable glands	3 knockouts for M20 x 1.5 cable glands 2 knockouts for NPT ½" or rigid metallic conduit
	Weight	Approx. 1 kg

\*) User-defined

1) At nominal operating conditions

2) ±1 digit

3) Plus sensor error

# Stratos Eco 2405 Oxy

## Terminal Assignments

20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
24 to 230 V ac/dc		clean	alarm	do not connect		rel. 1	+ - +		out 2	out 1					RTD do not connect	RTD	aux. el.	ref. el.	meas. el.
power										do not connect									
contacts										output									

**MAX. RELAY CONTACT RATING:** AC < 250 V / < 3 A / < 750 VA, DC < 30 V / < 3 A / < 90 W, RESISTIVE  
**WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.**  
**WARNING - BONDING BETWEEN CONDUIT IS NOT AUTOMATIC AND MUST BE PROVIDED AS PART OF THE INSTALLATION. SEE INSTALLATION INSTRUCTIONS.**  
**WARNING - SUBSTITUTION OF COMPONENTS MAY IMPAIR SAFETY.**  
**WARNING - CLEAN ONLY WITH ANTISTATIC MOISTENED CLOTH.**  
**CAUTION - USE SUPPLY WIRES SUITABLE FOR 30°C ABOVE SURROUNDING AMBIENT AND RATED AT LEAST 250 V. USE SIGNAL WIRES SUITABLE FOR AT LEAST 250 V.**  
**AVERTISSEMENT - RISQUE D'EXPLOSION - AVANT DE DECONNECTER L'EQUIPEMENT, COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DESIGNÉ NON DANGEREUX.**

NI, CLI, DIV2, GPA, B, C, D, T4  
 NI, CLI, ZN2, GPIIC, T4  
 CLI DIV2 GPA, B, C, D, T4  
 Ex nA IIC T4

ENCLASURE TYPE 2  
 Tamb -20 to +55 °C

Made in Germany

75430/000000 F-2405PH